

## **Space Weather Highlights** **25 September – 01 October 2000**

**SWO PRF 1309**  
**03 October 2000**

Solar activity varied from low to high levels. Activity was at moderate levels on 25 September due to isolated, low-level M-class flares from Regions 9169 (N11, L = 078, class/area Fkc/2140 on 19 September) and 9166 (S12, L = 123, class/area Eko/760 on 21 September). Activity dropped to low levels during 26 - 29 September with isolated to occasional C-class subflares. Activity increased to high levels on 30 September due to an X1/Sf flare at 30/2321 UTC from Region 9169 as it was crossing the west limb. Region 9169 also produced an M5 X-ray flare at 01/0701 UTC with an associated 200 SFU Tenflare and a loop prominence system. This large, moderately complex region had been gradually decaying for several days prior to the major flare activity. Region 9178 (S23, L = 312, class/area Dai/160 on 01 October) produced a long-duration M2/Sf at 01/1410 UTC as well as a C3/Sf flare at 01/1304 UTC associated with a Type II radio sweep. Both flares occurred during a period of growth in the region.

Data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. A coronal hole signature was observed during 25 - 28 September with velocities as high as 670 km/sec along with decreased densities. Coronal hole effects subsided during 28 September. A transient signature was observed during 30 September - 01 October with a moderate increase in wind velocities and densities, and periods of southward IMF Bz with deflections to minus 16 nT (GSM). Earth was within a positive polarity (away) solar sector during most of the period.

There were no proton events at geosynchronous orbit during the period.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate to high levels during 26 - 29 September. Fluxes were at normal to moderate levels during the remainder of the period.

The geomagnetic field was disturbed during 25 - 28 September due to coronal hole effects. Unsettled to active periods occurred during this disturbance. Activity declined to quiet to unsettled levels on 29 September. Activity increased to unsettled to minor storm levels on 30 September with major to severe storm periods detected at high latitudes. Activity returned to quiet to unsettled levels during the latter half of 01 October.

## **Space Weather Outlook** **04 October - 30 October 2000**

Solar activity is expected to be at low to moderate levels. Isolated M-class flares are expected sometime during the period. Chances for major flare activity are expected to increase beginning 14 October with the return of old Region 9169.

There will be an increased chance for a proton event at geosynchronous orbit beginning 14 October with the expected return of old Region 9169.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate to high levels during 17 - 19 October. Normal to moderate levels are expected during the remainder of the period.

Geomagnetic field activity is expected to be at unsettled to minor storm levels during 04 - 05 October due to recent CME activity. Active to minor storm periods will be possible during 16 - 18 October due to coronal hole effects. Quiet to unsettled levels are expected for the rest of the period, barring an Earth-directed CME.



### Daily Solar Data

| Date         | Radio Flux<br>10.7 cm | Sun spot<br>No. | Sunspot Area<br>(10 <sup>6</sup> hemi.) | X-ray Background | Flares     |   |   |         |   |   |   |   |
|--------------|-----------------------|-----------------|---|------------------|------------|---|---|---------|---|---|---|---|
|              |                       |                 |   |                  | X-ray Flux |   |   | Optical |   |   |   |   |
|              |                       |                 |   |                  | C          | M | X | S       | 1 | 2 | 3 | 4 |
| 25 September | 226                   | 215             | 2240                                    | C1.4             | 3          | 2 | 0 | 5       | 1 | 0 | 0 | 0 |
| 26 September | 224                   | 223             | 2060                                    | C1.0             | 6          | 0 | 0 | 7       | 0 | 0 | 0 | 0 |
| 27 September | 205                   | 233             | 1850                                    | C1.7             | 13         | 0 | 0 | 19      | 1 | 0 | 0 | 0 |
| 28 September | 202                   | 211             | 1400                                    | C1.4             | 5          | 0 | 0 | 5       | 1 | 0 | 0 | 0 |
| 29 September | 192                   | 164             | 1530                                    | C1.1             | 8          | 0 | 0 | 7       | 2 | 0 | 0 | 0 |
| 30 September | 194                   | 155             | 1010                                    | C1.2             | 8          | 2 | 1 | 18      | 0 | 0 | 0 | 0 |
| 01 October   | 202                   | 157             | 880                                     | C1.5             | 6          | 2 | 0 | 16      | 2 | 0 | 0 | 0 |

### Daily Particle Data

| Date         | Proton Fluence<br>(protons/cm <sup>2</sup> -day-sr) |        |         | Electron Fluence<br>(electrons/cm <sup>2</sup> -day-sr) |        |       |
|--------------|---|--------|---------|---|--------|-------|
|              | >1MeV   | >10MeV | >100MeV | >.6MeV  | >2MeV  | >4MeV |
| 25 September | 2.2E+5  | 1.0E+4 | 2.7E+3  |   | 1.2E+7 |       |
| 26 September | 5.3E+5  | 1.0E+4 | 2.8E+3  |   | 7.6E+7 |       |
| 27 September | 2.2E+5  | 1.0E+4 | 2.7E+3  |   | 1.7E+8 |       |
| 28 September | 2.8E+5  | 1.0E+4 | 2.9E+3  |   | 1.5E+8 |       |
| 29 September | 7.7E+4  | 1.0E+4 | 2.9E+3  |   | 5.4E+7 |       |
| 30 September | 6.0E+5  | 1.0E+4 | 2.9E+3  |   | 9.0E+6 |       |
| 01 October   | 2.7E+5  | 1.0E+4 | 3.0E+3  |   | 1.2E+7 |       |

### Daily Geomagnetic Data

| Date         | Middle Latitude<br>Fredericksburg |                 | High Latitude<br>College |                 | Estimated<br>Planetary |                 |
|--------------|-----------------------------------|-----------------|--------------------------|-----------------|------------------------|-----------------|
|              | A                                 | K-indices       | A                        | K-indices       | A                      | K-indices       |
| 25 September | 13                                | 2-2-3-3-3-2-3-4 | 30                       | 2-1-5-6-4-5-3-3 | 16                     | 2-2-3-4-4-3-3-4 |
| 26 September | 17                                | 4-4-3-3-3-2-3-3 | 37                       | 3-3-5-6-6-4-3-3 | 21                     | 4-4-4-4-4-4-3-3 |
| 27 September | 8                                 | 3-2-2-2-2-1-2-2 | 14                       | 3-2-3-5-2-2-2-1 | 11                     | 3-3-3-3-3-2-2-2 |
| 28 September | 9                                 | 2-4-2-3-2-2-0-0 | 20                       | 2-3-2-5-5-4-1-1 | 12                     | 2-4-2-3-4-3-2-1 |
| 29 September | 5                                 | 2-2-1-2-2-1-1-1 | 6                        | 1-1-0-3-3-2-1-1 | 7                      | 3-2-1-2-2-2-2-2 |
| 30 September | 25                                | 3-3-4-5-4-3-4-4 | 69                       | 2-4-7-7-6-5-4-6 | 45                     | 3-4-6-6-5-5-5-5 |
| 01 October   | 9                                 | 4-3-3-1-1-1-1-1 | 17                       | 4-3-3-5-3-2-2-1 | 13                     | 4-4-3-3-2-3-2-2 |

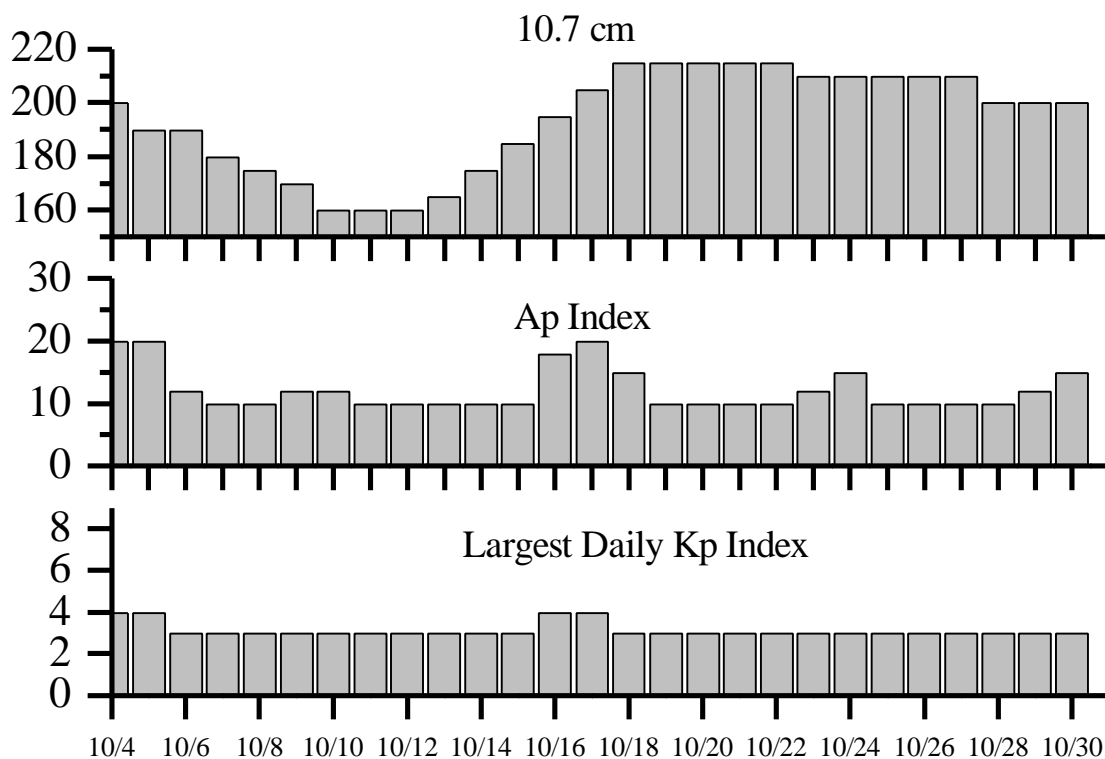


### *Alerts and Warnings Issued*

| Date & Time of Issue | Type of Alert or Warning                      | Date & Time of Event UT   |
|----------------------|---|---------------------------|
| 25 Sep 0030          | 2 – 245 MHz Radio Bursts                      | 24 Sep                    |
| 25 Sep 0030          | 245 MHz Noise Storm                           | 24 Sep                    |
| 25 Sep 0247          | 10cm Radio Burst 490 F.U.                     | 25 Sep 0200               |
| 26 Sep 0008          | 5 – 245 MHz Radio Bursts                      | 25 Sep                    |
| 26 Sep 0008          | 245 MHz Noise Storm                           | 25 Sep                    |
| 26 Sep 0255          | K = 4 Warning                                 | 26 Sep 0257 - 1500        |
| 26 Sep 0300          | K = 4 Observed                                | 26 Sep 00 - 03            |
| 26 Sep 1426          | EXTENDED K = 4 Warning                        | 26/0257 – 27/1500 Sep     |
| 26 Sep 1430          | Electron Event >2MeV $\geq$ 1000pfu           | 26 Sep 1345               |
| 26 Sep 1443          | A $\geq$ 20 Watch                             | 27 Sep                    |
| 26 Sep 1520          | A $\geq$ 20 Observed                          | 26 Sep 1500               |
| 27 Sep 0013          | 245 MHz Noise Storm                           | 26 Sep                    |
| 27 Sep 0032          | CONTINUED Electron Event >2MeV $\geq$ 1000pfu | 26 Sep 1345               |
| 27 Sep 0300          | ENDED A $\geq$ 20 Observed                    | 27 Sep 0300               |
| 28 Sep 0009          | 245 MHz Radio Burst                           | 27 Sep                    |
| 28 Sep 0009          | 245 MHz Noise Storm                           | 27 Sep                    |
| 28 Sep 0028          | CONTINUED Electron Event >2MeV $\geq$ 1000pfu | 26 Sep 1345               |
| 28 Sep 0600          | K = 4 Observed                                | 28 Sep 03 - 06            |
| 28 Sep 1204          | K = 4 Observed                                | 28 Sep 09 - 12            |
| 29 Sep 0006          | 2 – 245 MHz Radio Bursts                      | 28 Sep                    |
| 29 Sep 0006          | 245 MHz Noise Storm                           | 28 Sep                    |
| 29 Sep 0012          | CONTINUED Electron Event >2MeV $\geq$ 1000pfu | 26 Sep 1345               |
| 30 Sep 0016          | CONTINUED Electron Event >2MeV $\geq$ 1000pfu | 26 Sep 1345               |
| 30 Sep 0558          | K = 4 Observed                                | 30 Sep 03 - 06            |
| 30 Sep 0600          | K = 4 Warning                                 | 30 Sep 06 - 15            |
| 30 Sep 0853          | K = 5 Warning                                 | 30 Sep 0855 - 1500        |
| 30 Sep 0859          | K = 5 Observed                                | 30 Sep 06 - 09            |
| 30 Sep 1501          | A $\geq$ 20 Observed                          | 30 Sep 1501               |
| 30 Sep 2222          | K = 4 Warning                                 | 30 Sep 2225 - 01 Oct 1500 |
| 30 Sep 2246          | K = 5 Warning                                 | 30 Sep 2250 - 01 Oct 1200 |
| 30 Sep 2339          | X-Ray event X1.2/SF                           | 30 Sep 2321               |
| 01 Oct 0002          | A $\geq$ 30 Observed                          | 01 Oct 0000               |
| 01 Oct 0020          | 3 – 245 MHz Radio Bursts                      | 30 Sep                    |
| 01 Oct 0026          | K = 5 Observed                                | 30 Sep 21 - 24            |
| 01 Oct 0730          | X-Ray event M5.0                              | 01 Oct 0701               |
| 01 Oct 0742          | 10cm Radio Burst 200 F.U.                     | 01 Oct 0643               |
| 01 Oct 0903          | ENDED A $\geq$ 30 Observed                    | 01 Oct 0900               |
| 01 Oct 1340          | Type II Radio Emission                        | 01 Oct 1312               |
| 01 Oct 2107          | ENDED A > 20 Observed                         | 30 Sep 1501               |



## Twenty-seven Day Outlook



| Date   | Radio Flux<br>10.7 cm | Planetary<br>A Index | Largest<br>Kp Index | Date   | Radio Flux<br>10.7 cm | Planetary<br>A Index | Largest<br>Kp Index |
|--------|-----------------------|----------------------|---------------------|--------|-----------------------|----------------------|---------------------|
| 04 Oct | 200                   | 20                   | 4                   | 18 Oct | 215                   | 15                   | 3                   |
| 05     | 190                   | 20                   | 4                   | 19     | 215                   | 10                   | 3                   |
| 06     | 190                   | 12                   | 3                   | 20     | 215                   | 10                   | 3                   |
| 07     | 180                   | 10                   | 3                   | 21     | 215                   | 10                   | 3                   |
| 08     | 175                   | 10                   | 3                   | 22     | 215                   | 10                   | 3                   |
| 09     | 170                   | 12                   | 3                   | 23     | 210                   | 12                   | 3                   |
| 10     | 160                   | 12                   | 3                   | 24     | 210                   | 15                   | 3                   |
| 11     | 160                   | 10                   | 3                   | 25     | 210                   | 10                   | 3                   |
| 12     | 160                   | 10                   | 3                   | 26     | 210                   | 10                   | 3                   |
| 13     | 165                   | 10                   | 3                   | 27     | 210                   | 10                   | 3                   |
| 14     | 175                   | 10                   | 3                   | 28     | 200                   | 10                   | 3                   |
| 15     | 185                   | 10                   | 3                   | 29     | 200                   | 12                   | 3                   |
| 16     | 195                   | 18                   | 4                   | 30     | 200                   | 15                   | 3                   |
| 17     | 205                   | 20                   | 4                   |        |                       |                      |                     |



### *Energetic Events*

| Date   | Time  |      | X-ray    |       | Optical Information |               |                     | Peak     |            | Sweep Freq |           |    |
|--------|-------|------|----------|-------|---------------------|---------------|---------------------|----------|------------|------------|-----------|----|
|        | Begin | Max  | ½<br>Max | Class | Integ<br>Flux       | Imp/<br>Brtns | Location<br>Lat CMD | Rgn<br># | Radio Flux |            | Intensity |    |
|        |       |      |          |       |                     |               |                     |          | 245        | 2695       | II        | IV |
| 25 Sep | 0041  | 0053 | 0104     | M3.4  | .027                | 1N            | S11W59              | 9166     |            |            |           |    |
| 25 Sep | 0205  | 0215 | 0225     | M1.8  | .015                |               |                     | 9169     | 3300       | 460        |           |    |
| 30 Sep | 1738  | 1827 | 1905     | M1.0  | .039                | SF            | S20E42              | 9178     |            |            |           |    |
| 30 Sep | 2008  | 2016 | 2024     | M1.8  | .012                | SF            | S20E41              | 9178     |            |            |           |    |
| 30 Sep | 2038  | 2044 | 2052     | C9.9  | .007                | SF            | S19E38              | 9178     |            |            |           |    |
| 30 Sep | 2313  | 2321 | 2328     | X1.2  | .062                | SF            | N07W91              | 9169     | 36         | 130        |           |    |
| 01 Oct | 0623  | 0701 | 0725     | M5.0  | .110                |               |                     | 9169     | 550        | 180        |           |    |
| 01 Oct | 1356  | 1410 | 1441     | M2.2  | .047                | SF            | S24E27              | 9178     |            |            |           |    |

### *Flare List*

| Date         | Time  |       |       | X-ray<br>Class. | Imp /<br>Brtns | Optical<br>Location<br>Lat CMD | Rgn  |
|--------------|-------|-------|-------|-----------------|----------------|--------------------------------|------|
|              | Begin | Max   | End   |                 |                |                                |      |
| 25 September | 0016  | 0017  | 0024  |                 | SF             | N13W16                         | 9169 |
|              | 0045  | 0055  | 0121  | M3.4            | 1N             | S11W59                         | 9166 |
|              | 0205  | 0215  | 0225  | M1.8            |                |                                | 9169 |
|              | 1223  | U1223 | A1250 | C2.2            | SF             | N17W15                         | 9169 |
|              | 1339  | 1341  | 1351  |                 | SF             | S13W63                         | 9166 |
|              | 1423  | 1426  | 1430  |                 | SF             | S10E73                         | 9173 |
|              | 1454  | 1457  | 1459  | C1.8            |                |                                |      |
|              | 2008  | 2011  | 2014  | C1.5            |                |                                |      |
| 26 September | 2320  | 2320  | 2326  |                 | SF             | N10W23                         | 9169 |
|              | 0055  | 0059  | 0102  | C4.2            |                |                                |      |
|              | 0443  | 0446  | 0448  | C2.0            |                |                                |      |
|              | 0922  | 0926  | 0936  | C2.5            |                |                                |      |
|              | B1232 | U1233 | A1240 | C4.3            | SF             | S15E59                         | 9173 |
|              | 1348  | 1354  | 1400  |                 | SF             | S07W26                         | 9170 |
|              | 1949  | 2000  | 2005  | C8.2            |                |                                |      |
|              | 2106  | 2110  | 2116  |                 | SF             | S08E89                         |      |
|              | 2116  | 2122  | 2129  |                 | SF             | S09E89                         |      |
|              | 2142  | 2147  | 2205  | C6.7            | SF             | S13E57                         | 9173 |
| 27 September | 2307  | 2308  | 2311  |                 | SF             | N15W34                         | 9169 |
|              | 2351  | 2353  | 2358  |                 | SF             | N22E68                         | 9175 |
|              | 0015  | 0016  | 0031  |                 | SF             | S13E53                         | 9173 |
|              | 0117  | 0119  | 0154  | C5.2            | SF             | N17W52                         | 9167 |
|              | 0137  | 0138  | 0200  |                 | SF             | N11W46                         | 9169 |
|              | 0307  | 0310  | 0331  | C9.6            | 1N             | N18W56                         | 9167 |
|              | 0311  | 0312  | 0317  |                 | SF             | S09E83                         | 9176 |
|              | 0332  | 0332  | 0339  |                 | SF             | S13E49                         | 9173 |
|              | 0446  | 0449  | 0455  |                 | SF             | S08W37                         | 9170 |
|              | 1148  | 1151  | 1153  | C1.8            |                |                                |      |
|              | 1229  | 1235  | 1248  | C2.0            |                |                                |      |
| 1308         | 1311  | 1315  | C1.8  |                 |                |                                |      |
| 1350         | 1353  | 1406  | C2.2  | SF              | S07E77         | 9176                           |      |
| 1415         | 1415  | 1424  |       | SF              | N10W45         | 9169                           |      |



*Flare List – continued.*

| Date         | Time         |       |       | X-ray<br>Class. | Optical        |                     | Rgn    |      |
|--------------|--------------|-------|-------|-----------------|----------------|---------------------|--------|------|
|              | Begin        | Max   | End   |                 | Imp /<br>Brtns | Location<br>Lat CMD |        |      |
| 27 September | 1416         | 1421  | 1428  |                 | SF             | S07E78              | 9176   |      |
|              | 1428         | 1435  | 1439  |                 | SF             | S08E77              | 9176   |      |
|              | 1429         | 1430  | 1437  |                 | SF             | N07W47              | 9169   |      |
|              | 1508         | 1508  | 1512  |                 | SF             | S08E78              | 9176   |      |
|              | 1514         | 1515  | 1525  | C2.4            | SF             | N14W44              | 9169   |      |
|              | 1553         | 1558  | 1602  |                 | SF             | S11E45              | 9173   |      |
|              | 1557         | 1557  | 1602  | C2.1            | SF             | N07W48              | 9169   |      |
|              | 1631         | 1635  | 1641  | C1.7            |                |                     |        |      |
|              | 1707         | 1710  | 1712  | C2.6            |                |                     |        |      |
|              | 1917         | 1918  | 1923  | C3.6            | SF             | N07W50              | 9169   |      |
|              | 2137         | 2138  | 2143  |                 | SF             | S14E44              | 9173   |      |
|              | 2257         | 2300  | 2310  | C2.7            | SF             | S16E41              | 9173   |      |
|              | 2348         | 2350  | 0025  | C2.0            | SF             | S14E36              | 9173   |      |
|              | 28 September | 0335  | 0336  | 0345            | C1.9           | SF                  | N12W56 | 9169 |
|              |              | 1000  | 1004  | 1006            | C2.4           |                     |        |      |
| 1124         |              | 1132  | 1146  | C2.4            |                |                     |        |      |
| 2018         |              | 2024  | 2027  |                 | SF             | S04E54              | 9176   |      |
| 2018         |              | 2022  | 2037  |                 | SF             | S10E30              | 9173   |      |
| 2041         |              | 2044  | 2110  | C4.4            | SF             | S11E23              | 9173   |      |
| 2148         |              | 2154  | 2209  |                 | SF             | N12E21              | 9172   |      |
| 29 September | B2250        | U2252 | A2341 | C4.7            | 1F             | S13E25              | 9173   |      |
|              | 0032         | 0035  | 0105  | C2.2            | SF             | S12E23              | 9173   |      |
|              | 0308         | 0319  | 0337  | C3.4            | SF             | S23E62              | 9178   |      |
|              | 0653         | 0657  | 0715  | C5.9            | 1F             | S13E18              | 9173   |      |
|              | 1016         | U1016 | A1021 | C3.0            | SF             | S07E50              | 9176   |      |
|              | 1305         | 1313  | 1317  | C4.5            |                |                     |        |      |
|              | 1450         | 1451  | 1456  |                 | SF             | S12E17              | 9173   |      |
|              | 1642         | 1644  | 1652  | C1.9            | SF             | S12E15              | 9173   |      |
|              | 1753         | 1757  | 1802  |                 | SF             | S22E56              | 9178   |      |
|              | 2049         | 2049  | 2055  | C2.8            | SF             | S11E13              | 9173   |      |
| 30 September | 2359         | 0004  | 0016  | C2.9            | 1F             | N11W78              | 9169   |      |
|              | 0317         | 0317  | 0325  | C2.3            | SF             | S13E10              | 9173   |      |
|              | 0432         | 0434  | 0441  | C4.7            | SF             | S13E09              | 9173   |      |
|              | 0554         | 0554  | 0602  |                 | SF             | S23E49              | 9178   |      |
|              | 0825         | 0829  | 0843  | C2.2            | SF             | S21E45              | 9178   |      |
|              | 0858         | 0859  | 0904  | C5.7            | SF             | S13E07              | 9173   |      |
|              | B0957        | U1006 | A1012 | C3.7            | SF             | S24E50              | 9178   |      |
|              | 1300         | 1302  | 1307  | C3.9            | SF             | S24E42              | 9178   |      |
|              | 1544         | 1548  | 1556  |                 | SF             | S05E33              | 9176   |      |
|              | 1623         | 1625  | 1627  | C3.6            | SF             | S20E43              | 9178   |      |
|              | 1624         | 1625  | 1644  |                 | SF             | S08E39              | 9176   |      |
|              | 1740         | 1814  | A1818 | M1.0            | SF             | S20E42              | 9178   |      |



*Flare List – continued.*

| Date         | Time  |       |       | X-ray<br>Class. | Optical        |                     | Rgn  |
|--------------|-------|-------|-------|-----------------|----------------|---------------------|------|
|              | Begin | Max   | End   |                 | Imp /<br>Brtns | Location<br>Lat CMD |      |
| 30 September | 1800  | 1801  | 1805  |                 | SF             | S12E07              | 9173 |
|              | 1931  | 1941  | 2013  | M1.8            | SF             | S20E41              | 9178 |
|              | 1950  | 1950  | 1955  |                 | SF             | N10W90              | 9169 |
|              | 2048  | 2049  | 2054  | C9.9            | SF             | S19E38              | 9178 |
|              | 2103  | 2107  | 2115  |                 | SF             | S20E39              | 9178 |
|              | 2120  | 2120  | 2124  |                 | SF             | S22E40              | 9178 |
|              | 2324  | 2326  | 2329  | X1.2            | SF             | N07W91              | 9169 |
| 01 October   | 0153  | 0156  | 0206  | C2.1            | 1F             | S06E25              | 9176 |
|              | 0243  | 0249  | 0255  | C2.1            |                |                     |      |
|              | 0413  | 0425  | 0449  |                 | SF             | S08E20              | 9176 |
|              | 0455  | 0455  | 0503  |                 | SF             | S12W07              | 9173 |
|              | 0548  | 0557  | 0613  | C2.3            | SF             | S21E33              | 9178 |
|              | 0623  | 0701  | 0725  | M5.0            |                |                     | 9169 |
|              | 0738  | 0741  | 0748  |                 | SF             | S21E32              | 9178 |
|              | 1123  | 1124  | 1140  | C2.5            | SF             | S22E26              | 9178 |
|              | 1138  | 1146  | 1151  |                 | SF             | N29W35              | 9177 |
|              | 1236  | 1243  | 1250  | C2.8            |                |                     |      |
|              | 1257  | 1303  | 1328  | C3.8            | 1F             | S10E15              | 9176 |
|              | B1318 | U1318 | A1455 | M2.2            | SF             | S24E27              | 9178 |
|              | 1532  | 1533  | 1546  |                 | SF             | S22E30              | 9178 |
|              | 1649  | 1703  | 1728  |                 | SF             | S15W11              | 9173 |
|              | 1658  | 1659  | 1705  |                 | SF             | S21E29              | 9178 |
|              | 1725  | 1738  | 1903  |                 | SF             | S23E34              | 9178 |
|              | 1739  | 1739  | 1814  |                 | SF             | S27E30              | 9178 |
|              | 1755  | 1757  | 1806  |                 | SF             | N27W40              | 9177 |
|              | 2010  | 2016  | 2030  |                 | SF             | S21E27              | 9178 |
|              | 2055  | 2057  | 2104  |                 | SF             | S20E25              | 9178 |
| 2213         | 2214  | 2255  |       | SF              | S21E25         | 9178                |      |



### Region Summary

| Date               | Location       |       | Sunspot Characteristics        |                   |               |               |              | Flares |   |   |         |    |   |   |   |  |  |  |  |  |  |  |  |
|--------------------|----------------|-------|--------------------------------|-------------------|---------------|---------------|--------------|--------|---|---|---------|----|---|---|---|--|--|--|--|--|--|--|--|
|                    | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray  |   |   | Optical |    |   |   |   |  |  |  |  |  |  |  |  |
|                    |                | Lon   |                                |                   |               |               |              | C      | M | X | S       | 1  | 2 | 3 | 4 |  |  |  |  |  |  |  |  |
| <i>Region 9166</i> |                |       |                                |                   |               |               |              |        |   |   |         |    |   |   |   |  |  |  |  |  |  |  |  |
| 14 Sep             | S13E71         | 130   | 0070                           | 04                | DSO           | 003           | B            | 2      |   |   |         | 4  |   |   |   |  |  |  |  |  |  |  |  |
| 15 Sep             | S14E60         | 127   | 0270                           | 10                | DSI           | 010           | B            | 3      |   |   |         | 5  |   |   |   |  |  |  |  |  |  |  |  |
| 16 Sep             | S14E50         | 124   | 0290                           | 11                | EAI           | 020           | B            | 1      |   |   |         | 8  |   |   |   |  |  |  |  |  |  |  |  |
| 17 Sep             | S14E37         | 124   | 0340                           | 11                | EAI           | 032           | B            | 1      |   |   |         | 4  |   |   |   |  |  |  |  |  |  |  |  |
| 18 Sep             | S14E24         | 124   | 0570                           | 11                | EAI           | 034           | BG           | 4      |   |   |         | 5  | 2 |   |   |  |  |  |  |  |  |  |  |
| 19 Sep             | S13E11         | 124   | 0670                           | 10                | DKC           | 033           | B            | 3      |   |   |         | 8  | 1 |   |   |  |  |  |  |  |  |  |  |
| 20 Sep             | S13W02         | 123   | 0590                           | 13                | EKI           | 050           | BG           |        |   |   |         | 1  |   |   |   |  |  |  |  |  |  |  |  |
| 21 Sep             | S12W16         | 124   | 0760                           | 12                | EKO           | 049           | BG           |        |   |   |         | 1  |   |   |   |  |  |  |  |  |  |  |  |
| 22 Sep             | S12W30         | 125   | 0610                           | 11                | EKI           | 048           | B            | 1      |   |   |         | 2  | 1 |   |   |  |  |  |  |  |  |  |  |
| 23 Sep             | S11W44         | 126   | 0450                           | 12                | EAI           | 042           | B            | 3      |   |   |         | 4  |   |   |   |  |  |  |  |  |  |  |  |
| 24 Sep             | S11W56         | 125   | 0340                           | 11                | EAI           | 038           | BG           | 5      | 1 |   |         | 12 |   | 1 |   |  |  |  |  |  |  |  |  |
| 25 Sep             | S12W70         | 125   | 0380                           | 10                | DAI           | 023           | B            |        | 1 |   |         | 1  | 1 |   |   |  |  |  |  |  |  |  |  |
| 26 Sep             | S12W82         | 124   | 0370                           | 10                | DKI           | 010           | B            |        |   |   |         |    |   |   |   |  |  |  |  |  |  |  |  |
| 27 Sep             | S11W93         | 122   | 0060                           | 02                | HSX           | 002           | A            |        |   |   |         |    |   |   |   |  |  |  |  |  |  |  |  |
|                    |                |       |                                |                   |               |               |              | 23     | 2 | 0 | 55      | 5  | 1 | 0 | 0 |  |  |  |  |  |  |  |  |

Crossed West Limb.

Absolute heliographic longitude: 123

|                    |        |     |      |    |     |     |    |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
|--------------------|--------|-----|------|----|-----|-----|----|---|---|---|----|---|---|---|---|--|--|--|--|--|--|--|--|
| <i>Region 9167</i> |        |     |      |    |     |     |    |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
| 16 Sep             | N12E80 | 094 | 0060 | 03 | HSX | 001 | A  |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
| 17 Sep             | N11E69 | 092 | 0170 | 08 | DSO | 005 | B  | 3 |   |   |    | 3 | 1 |   |   |  |  |  |  |  |  |  |  |
| 18 Sep             | N12E57 | 091 | 0320 | 10 | DAO | 012 | BG | 2 |   |   |    | 9 |   |   |   |  |  |  |  |  |  |  |  |
| 19 Sep             | N12E41 | 094 | 0360 | 12 | EAO | 013 | B  |   |   |   |    | 2 |   |   |   |  |  |  |  |  |  |  |  |
| 20 Sep             | N12E30 | 091 | 0210 | 14 | EAO | 016 | B  | 1 |   |   |    | 1 |   |   |   |  |  |  |  |  |  |  |  |
| 21 Sep             | N12E17 | 091 | 0160 | 13 | ESO | 020 | B  |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
| 22 Sep             | N13E03 | 092 | 0170 | 14 | CSO | 018 | B  |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
| 23 Sep             | N14W11 | 093 | 0140 | 10 | CSO | 011 | B  | 1 |   |   |    | 1 |   |   |   |  |  |  |  |  |  |  |  |
| 24 Sep             | N15W28 | 097 | 0080 | 03 | CSO | 006 | B  |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
| 25 Sep             | N15W42 | 097 | 0080 | 06 | CSO | 005 | B  |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
| 26 Sep             | N16W55 | 097 | 0060 | 05 | CSO | 004 | B  |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
| 27 Sep             | N16W69 | 098 | 0050 | 05 | CSO | 004 | B  | 2 |   |   |    | 1 | 1 |   |   |  |  |  |  |  |  |  |  |
| 28 Sep             | N16W81 | 097 | 0010 | 04 | CRO | 002 | B  |   |   |   |    |   |   |   |   |  |  |  |  |  |  |  |  |
|                    |        |     |      |    |     |     |    | 9 | 0 | 0 | 17 | 2 | 0 | 0 | 0 |  |  |  |  |  |  |  |  |

Crossed West Limb.

Absolute heliographic longitude: 092





**Region Summary – continued.**

| Date               | Location       |       | Sunspot Characteristics        |                   |               |               | Flares       |       |   |    |         |   |    |   |   |   |   |   |  |  |  |  |  |
|--------------------|----------------|-------|--------------------------------|-------------------|---------------|---------------|--------------|-------|---|----|---------|---|----|---|---|---|---|---|--|--|--|--|--|
|                    | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |    | Optical |   |    |   |   |   |   |   |  |  |  |  |  |
|                    |                | Lon   |                                |                   |               |               |              | C     | M | X  | S       | 1 | 2  | 3 | 4 |   |   |   |  |  |  |  |  |
| <i>Region 9169</i> |                |       |                                |                   |               |               |              |       |   |    |         |   |    |   |   |   |   |   |  |  |  |  |  |
| 18 Sep             | N08E70         | 077   | 0870                           | 14                | EKI           | 009           | B            |       |   |    |         |   |    |   |   |   |   |   |  |  |  |  |  |
| 19 Sep             | N09E60         | 075   | 2140                           | 17                | FKC           | 028           | BGD          | 1     |   |    |         |   | 5  |   |   |   |   |   |  |  |  |  |  |
| 20 Sep             | N10E46         | 075   | 1940                           | 19                | FKC           | 046           | BGD          | 2     |   |    |         |   | 5  |   |   |   |   |   |  |  |  |  |  |
| 21 Sep             | N09E32         | 076   | 1910                           | 19                | FKC           | 068           | BGD          | 1     |   |    |         |   | 3  |   |   |   |   |   |  |  |  |  |  |
| 22 Sep             | N10E19         | 076   | 1880                           | 18                | FKC           | 102           | BGD          | 8     |   |    |         |   | 15 |   |   |   |   |   |  |  |  |  |  |
| 23 Sep             | N11E04         | 078   | 1970                           | 21                | FKC           | 090           | BGD          | 5     |   |    |         |   | 10 | 1 |   |   |   |   |  |  |  |  |  |
| 24 Sep             | N11W09         | 078   | 1930                           | 22                | FKC           | 119           | BGD          | 1     |   |    |         |   | 4  |   |   |   |   |   |  |  |  |  |  |
| 25 Sep             | N11W22         | 077   | 1450                           | 20                | FKC           | 088           | BGD          | 1     | 1 |    |         |   | 3  |   |   |   |   |   |  |  |  |  |  |
| 26 Sep             | N12W34         | 076   | 1210                           | 18                | FKC           | 067           | BG           |       |   |    |         |   | 1  |   |   |   |   |   |  |  |  |  |  |
| 27 Sep             | N12W47         | 076   | 1190                           | 18                | FKC           | 067           | BG           | 3     |   |    |         |   | 6  |   |   |   |   |   |  |  |  |  |  |
| 28 Sep             | N12W58         | 074   | 0790                           | 20                | FKC           | 051           | BG           | 1     |   |    |         |   | 1  |   |   |   |   |   |  |  |  |  |  |
| 29 Sep             | N12W77         | 080   | 0720                           | 11                | EKC           | 010           | B            | 1     |   |    |         |   |    | 1 |   |   |   |   |  |  |  |  |  |
| 30 Sep             | N11W92         | 082   | 0230                           | 09                | DKO           | 005           | B            |       |   |    |         |   | 1  | 2 |   |   |   |   |  |  |  |  |  |
|                    |                |       |                                |                   |               |               |              |       |   | 24 | 1       | 1 | 55 | 2 | 0 | 0 | 0 | 0 |  |  |  |  |  |

Crossed West Limb.

Absolute heliographic longitude: 078

*Region 9170*

|        |        |     |      |    |     |     |    |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
|--------|--------|-----|------|----|-----|-----|----|--|--|---|---|---|---|---|---|---|---|---|--|--|--|--|
| 21 Sep | S07E28 | 080 | 0040 | 05 | CAO | 008 | B  |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 22 Sep | S07E15 | 080 | 0070 | 07 | DSO | 018 | B  |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 23 Sep | S06E01 | 081 | 0070 | 08 | DAO | 020 | B  |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 24 Sep | S05W14 | 083 | 0100 | 09 | DAO | 017 | B  |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 25 Sep | S06W27 | 082 | 0080 | 10 | DAO | 019 | B  |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 26 Sep | S05W38 | 080 | 0120 | 15 | EAI | 026 | B  |  |  |   |   |   | 1 |   |   |   |   |   |  |  |  |  |
| 27 Sep | S06W51 | 080 | 0130 | 17 | FAO | 017 | BG |  |  |   |   |   | 1 |   |   |   |   |   |  |  |  |  |
| 28 Sep | S06W63 | 079 | 0080 | 17 | FSO | 010 | B  |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 29 Sep | S05W79 | 082 | 0030 | 12 | CRO | 004 | B  |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 30 Sep | S05W92 | 082 |      |    |     |     |    |  |  |   |   |   |   |   |   |   |   |   |  |  |  |  |
|        |        |     |      |    |     |     |    |  |  | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |

Crossed West Limb.

Absolute heliographic longitude: 081



**Region Summary – continued.**

| Date | Location       |       | Sunspot Characteristics        |                   |               |               | Flares       |       |   |   |         |   |   |   |
|------|----------------|-------|--------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|
|      | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |
|      |                | Lon   |                                |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 |

*Region 9171*

|        |        |     |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|---|---|---|---|---|---|---|---|
| 22 Sep | S15E70 | 025 | 0040 | 01 | HRX | 001 | A |  |  |  |  |   |   |   |   |   |   |   |   |
| 23 Sep | S15E59 | 023 | 0050 | 07 | CSO | 003 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 24 Sep | S15E47 | 022 | 0080 | 07 | DSO | 003 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 25 Sep | S15E33 | 022 | 0080 | 07 | CSO | 003 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 26 Sep | S14E19 | 023 | 0070 | 04 | CSO | 004 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 27 Sep | S13E04 | 025 | 0050 | 02 | HAX | 003 | A |  |  |  |  |   |   |   |   |   |   |   |   |
| 28 Sep | S13W09 | 025 | 0050 | 04 | CSO | 004 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 29 Sep | S13W22 | 025 | 0040 | 06 | CSO | 004 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 30 Sep | S13W38 | 028 | 0020 | 02 | HSX | 002 | A |  |  |  |  |   |   |   |   |   |   |   |   |
| 01 Oct | S12W51 | 027 | 0020 | 01 | HSX | 001 | A |  |  |  |  |   |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |  |  |  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 025

*Region 9172*

|        |        |     |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|---|---|---|---|---|---|---|---|
| 24 Sep | N12E70 | 359 | 0050 | 02 | HSX | 001 | A |  |  |  |  |   |   |   |   |   |   |   |   |
| 25 Sep | N12E58 | 357 | 0100 | 06 | DAO | 006 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 26 Sep | N12E46 | 356 | 0080 | 07 | DSO | 009 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 27 Sep | N12E32 | 357 | 0080 | 05 | HSX | 006 | A |  |  |  |  |   |   |   |   |   |   |   |   |
| 28 Sep | N12E18 | 358 | 0050 | 04 | CSO | 003 | B |  |  |  |  |   |   |   |   |   |   |   | 1 |
| 29 Sep | N12E08 | 355 | 0050 | 06 | CSO | 005 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 30 Sep | N13W07 | 357 | 0040 | 06 | CSO | 003 | B |  |  |  |  |   |   |   |   |   |   |   |   |
| 01 Oct | N14W21 | 357 | 0040 | 01 | HSX | 001 | A |  |  |  |  |   |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |  |  |  |  | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 357

*Region 9173*

|        |        |     |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |     |                   |
|--------|--------|-----|------|----|-----|-----|---|---|--|--|--|--|--|--|--|--|--|--|-----|-------------------|
| 24 Sep | S14E72 | 357 | 0030 | 01 | HSX | 001 | A |   |  |  |  |  |  |  |  |  |  |  |     |                   |
| 25 Sep | S13E60 | 355 | 0070 | 03 | HAX | 001 | A |   |  |  |  |  |  |  |  |  |  |  | 1   |                   |
| 26 Sep | S13E51 | 351 | 0120 | 12 | EAO | 010 | B | 2 |  |  |  |  |  |  |  |  |  |  | 2   |                   |
| 27 Sep | S13E38 | 351 | 0110 | 11 | EAO | 017 | B | 2 |  |  |  |  |  |  |  |  |  |  | 6   |                   |
| 28 Sep | S12E25 | 351 | 0130 | 11 | EAO | 025 | B | 2 |  |  |  |  |  |  |  |  |  |  | 2 1 |                   |
| 29 Sep | S12E13 | 350 | 0220 | 12 | EAI | 025 | B | 4 |  |  |  |  |  |  |  |  |  |  | 4 1 |                   |
| 30 Sep | S11W02 | 352 | 0260 | 14 | EAI | 023 | B | 3 |  |  |  |  |  |  |  |  |  |  | 4   |                   |
| 01 Oct | S11W15 | 351 | 0260 | 14 | EAI | 021 | B |   |  |  |  |  |  |  |  |  |  |  | 2   |                   |
|        |        |     |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |     | 13 0 0 21 2 0 0 0 |

Still on Disk.

Absolute heliographic longitude: 352



**Region Summary – continued.**

| Date | Location    |       | Sunspot Characteristics        |                   |               |               | Flares       |       |   |   |         |   |   |   |
|------|-------------|-------|--------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|
|      | ° Lat ° CMD | Helio | Area<br>(10 <sup>6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |
|      |             | Lon   |                                |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 |

*Region 9174*

|        |        |     |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|---|---|---|---|---|---|---|
| 26 Sep | S30W60 | 102 | 0000 | 00 | AXX | 001 | A |  |  |  |  |   |   |   |   |   |   |   |
| 27 Sep | S30W71 | 100 | 0020 | 01 | HRX | 001 | A |  |  |  |  |   |   |   |   |   |   |   |
| 28 Sep | S30W84 | 100 |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |  |  |  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Crossed West Limb.

Absolute heliographic longitude: 102

*Region 9175*

|        |        |     |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|---|---|---|---|---|---|---|
| 26 Sep | N21E67 | 335 | 0030 | 05 | CRO | 002 | B |  |  |  |  |   |   |   |   |   |   |   |
| 27 Sep | N22E55 | 334 | 0020 | 03 | BXO | 002 | B |  |  |  |  |   |   |   |   |   |   |   |
| 28 Sep | N22E44 | 332 | 0010 | 03 | BXO | 003 | B |  |  |  |  |   |   |   |   |   |   |   |
| 29 Sep | N22E32 | 331 | 0000 | 02 | AXX | 002 | A |  |  |  |  |   |   |   |   |   |   |   |
| 30 Sep | N22E19 | 331 |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |
| 01 Oct | N22E06 | 331 |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |  |  |  |  | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 331

*Region 9176*

|        |        |     |      |    |     |     |    |   |   |   |    |   |   |   |   |   |  |  |
|--------|--------|-----|------|----|-----|-----|----|---|---|---|----|---|---|---|---|---|--|--|
| 27 Sep | S10E68 | 321 | 0140 | 02 | HSX | 001 | A  | 1 |   |   |    |   |   |   |   |   |  |  |
| 28 Sep | S09E57 | 319 | 0250 | 10 | DAO | 009 | B  |   |   |   |    |   |   |   |   |   |  |  |
| 29 Sep | S09E45 | 318 | 0410 | 12 | EAO | 016 | B  | 1 |   |   |    |   |   |   |   |   |  |  |
| 30 Sep | S09E31 | 319 | 0310 | 13 | EKI | 024 | BG |   |   |   |    |   |   |   |   |   |  |  |
| 01 Oct | S09E18 | 318 | 0300 | 13 | EKI | 026 | BG | 2 |   |   |    |   |   |   |   |   |  |  |
|        |        |     |      |    |     |     |    |   |   |   |    |   |   |   |   |   |  |  |
|        |        |     |      |    |     |     |    | 4 | 0 | 0 | 10 | 2 | 0 | 0 | 0 | 0 |  |  |

Still on Disk.

Absolute heliographic longitude: 318

*Region 9177*

|        |        |     |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|---|---|---|---|---|---|---|
| 27 Sep | N28E01 | 028 | 0000 | 03 | BXO | 003 | B |  |  |  |  |   |   |   |   |   |   |   |
| 28 Sep | N29W11 | 027 | 0000 | 01 | AXX | 002 | A |  |  |  |  |   |   |   |   |   |   |   |
| 29 Sep | N30W23 | 026 | 0010 | 03 | BXO | 003 | B |  |  |  |  |   |   |   |   |   |   |   |
| 30 Sep | N32W33 | 023 | 0020 | 05 | BXO | 003 | B |  |  |  |  |   |   |   |   |   |   |   |
| 01 Oct | N29W43 | 019 | 0070 | 05 | CAO | 009 | B |  |  |  |  |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |  |  |  |  |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |  |  |  |  | 0 | 0 | 0 | 2 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 028



***Region Summary – continued.***

| Date                                 | Location       |       | Sunspot Characteristics        |                   |               |               | Flares       |       |   |   |         |    |   |   |   |   |   |   |
|--------------------------------------|----------------|-------|--------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|----|---|---|---|---|---|---|
|                                      | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |    |   |   |   |   |   |   |
|                                      |                | Lon   |                                |                   |               |               |              | C     | M | X | S       | 1  | 2 | 3 | 4 |   |   |   |
| <i>Region 9178</i>                   |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |
| 28 Sep                               | S23E63         | 313   | 0030                           | 02                | CRO           | 002           | B            |       |   |   |         |    |   |   |   |   |   |   |
| 29 Sep                               | S22E49         | 314   | 0050                           | 06                | CAO           | 005           | B            | 1     |   |   |         | 2  |   |   |   |   |   |   |
| 30 Sep                               | S23E38         | 312   | 0120                           | 06                | DAO           | 011           | B            | 5     | 2 |   |         | 10 |   |   |   |   |   |   |
| 01 Oct                               | S22E24         | 312   | 0160                           | 09                | DAI           | 015           | B            | 1     | 1 |   |         | 11 |   |   |   |   |   |   |
|                                      |                |       |                                |                   |               |               |              | 7     | 3 | 0 | 23      | 0  | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk.                       |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |
| Absolute heliographic longitude: 312 |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |
| <i>Region 9179</i>                   |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |
| 30 Sep                               | N35E07         | 343   | 0010                           | 07                | BXO           | 004           | B            |       |   |   |         |    |   |   |   |   |   |   |
| 01 Oct                               | N34W06         | 342   | 0010                           | 01                | AXX           | 001           | A            |       |   |   |         |    |   |   |   |   |   |   |
|                                      |                |       |                                |                   |               |               |              | 0     | 0 | 0 | 0       | 0  | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk.                       |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |
| Absolute heliographic longitude: 342 |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |
| <i>Region 9180</i>                   |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |
| 01 Oct                               | S34W21         | 357   | 0020                           | 05                | BXO           | 003           | B            |       |   |   |         |    |   |   |   |   |   |   |
|                                      |                |       |                                |                   |               |               |              | 0     | 0 | 0 | 0       | 0  | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk.                       |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |
| Absolute heliographic longitude: 357 |                |       |                                |                   |               |               |              |       |   |   |         |    |   |   |   |   |   |   |

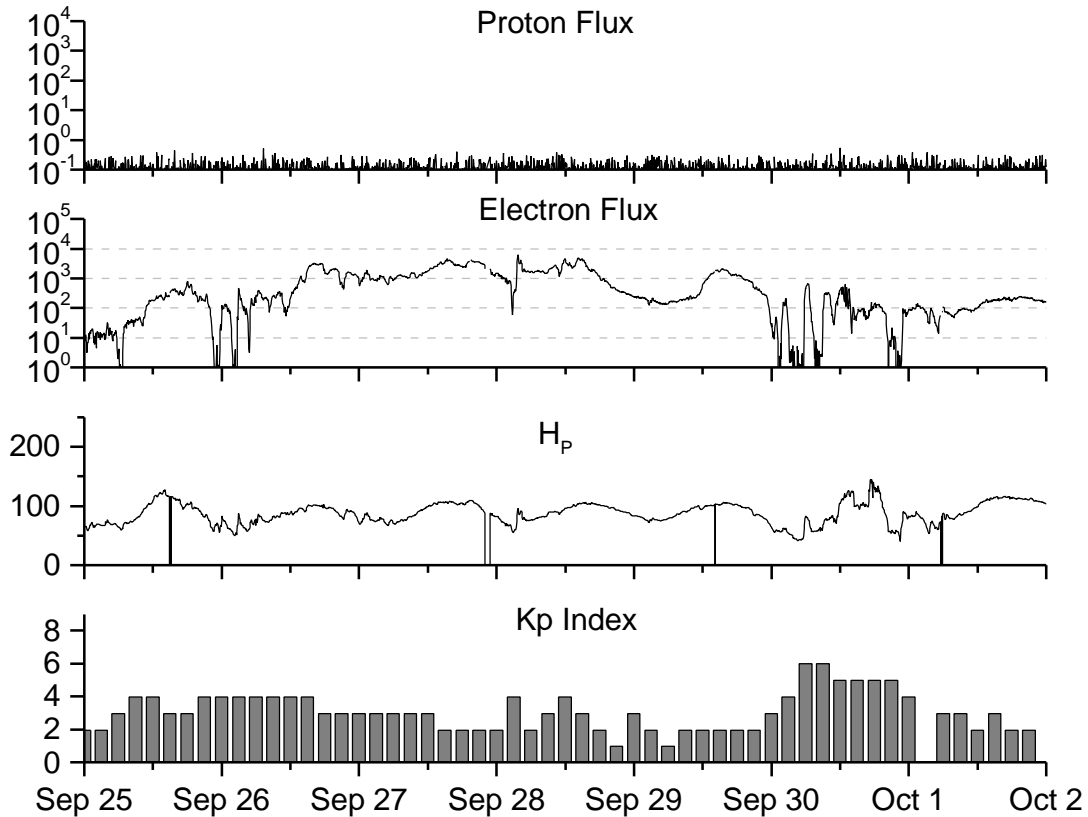


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

| Month       | Sunspot Numbers |       |        |               | Radio Flux |            | Geomagnetic |           |        |
|-------------|-----------------|-------|--------|---------------|------------|------------|-------------|-----------|--------|
|             | Observed values |       | Ratio  | Smooth values |            | *Penticton | Smooth      | Planetary | Smooth |
|             | SWO             | RI    | RI/SWO | SWO           | RI         | 10.7 cm    | Value       | Ap        | Value  |
| <b>1998</b> |                 |       |        |               |            |            |             |           |        |
| October     | 77.0            | 55.5  | 0.72   | 97.7          | 70.5       | 117.3      | 127.9       | 13        | 12.8   |
| November    | 99.5            | 74.0  | 0.74   | 101.3         | 73.0       | 140.2      | 130.0       | 16        | 12.4   |
| December    | 120.8           | 81.9  | 0.68   | 108.8         | 77.9       | 150.1      | 134.3       | 08        | 11.9   |
| <b>1999</b> |                 |       |        |               |            |            |             |           |        |
| January     | 94.3            | 62.0  | 0.66   | 116.5         | 82.6       | 142.6      | 139.0       | 10        | 11.7   |
| February    | 93.4            | 66.3  | 0.71   | 120.2         | 84.6       | 142.0      | 142.6       | 12        | 11.6   |
| March       | 100.5           | 68.8  | 0.68   | 120.5         | 83.8       | 126.3      | 144.0       | 14        | 11.7   |
| April       | 92.9            | 63.7  | 0.69   | 123.8         | 85.5       | 117.2      | 145.8       | 12        | 12.2   |
| May         | 140.5           | 106.4 | 0.76   | 131.7         | 90.5       | 148.6      | 149.9       | 08        | 12.4   |
| June        | 208.3           | 137.7 | 0.66   | 136.0         | 93.1       | 169.8      | 152.9       | 07        | 12.4   |
| July        | 169.2           | 113.5 | 0.67   | 138.0         | 94.4       | 165.6      | 154.4       | 10        | 12.6   |
| August      | 136.1           | 93.7  | 0.69   | 142.8         | 97.5       | 170.8      | 156.3       | 15        | 12.9   |
| September   | 107.4           | 71.5  | 0.66   | 150.0         | 102.3      | 135.7      | 161.0       | 19        | 12.8   |
| October     | 167.7           | 116.7 | 0.69   | 158.5         | 107.7      | 164.8      | 167.2       | 19        | 12.7   |
| November    | 199.3           | 133.2 | 0.67   | 164.7         | 110.9      | 191.5      | 171.5       | 14        | 13.2   |
| December    | 123.5           | 86.4  | 0.70   | 165.9         | 110.9      | 169.8      | 173.4       | 10        | 13.9   |
| <b>2000</b> |                 |       |        |               |            |            |             |           |        |
| January     | 140.8           | 90.2  | 0.64   | 168.0         | 112.7      | 158.1      | 175.2       | 13        | 14.7   |
| February    | 161.9           | 112.3 | 0.69   | 172.1         | 116.6      | 173.2      | 176.3       | 15        | 15.3   |
| March       | 203.6           | 138.2 | 0.68   | 175.4         | 119.7      | 208.2      | 177.9       | 09        | 15.3   |
| April       | 193.4           | 125.3 | 0.65   |               |            | 184.2      |             | 15        |        |
| May         | 188.8           | 120.8 | 0.64   |               |            | 184.5      |             | 16        |        |
| June        | 190.3           | 124.9 | 0.66   |               |            | 178.8      |             | 16        |        |
| July        | 236.7           | 169.1 | 0.71   |               |            | 200.0      |             | 21        |        |
| August      | 166.6           | 130.5 | 0.78   |               |            | 163.1      |             | 18        |        |
| September   | 157.9           | 109.9 | 0.70   |               |            | 182.1      |             | 16        |        |

**NOTE:** All smoothed values after June 1999 and monthly values after December 1999 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 22, RI= 158.5, occurred July 1989. \* After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 25 September 2000*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

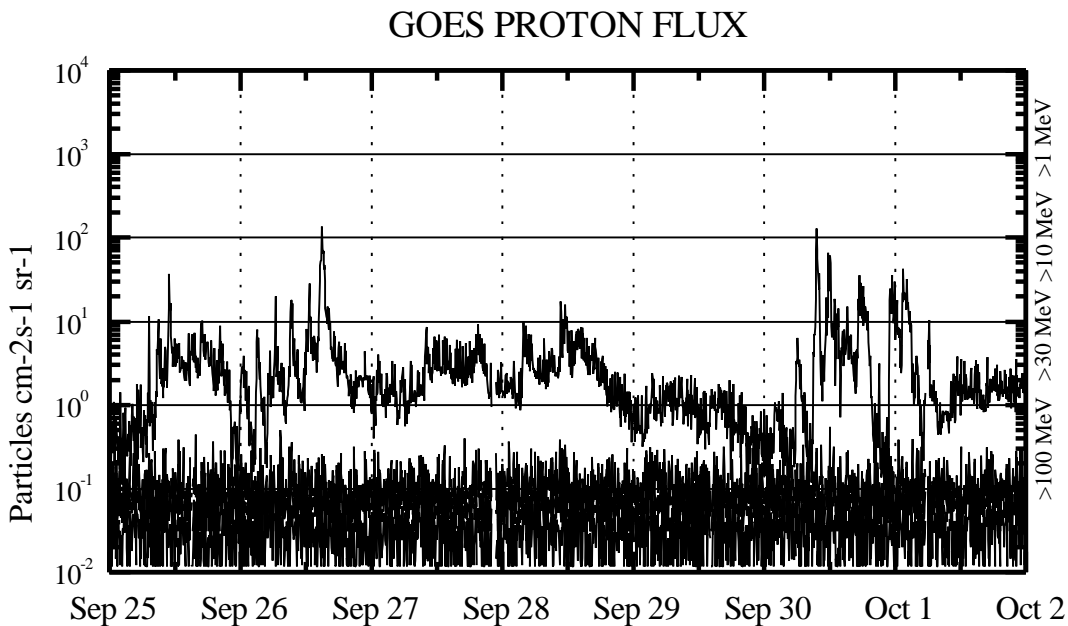
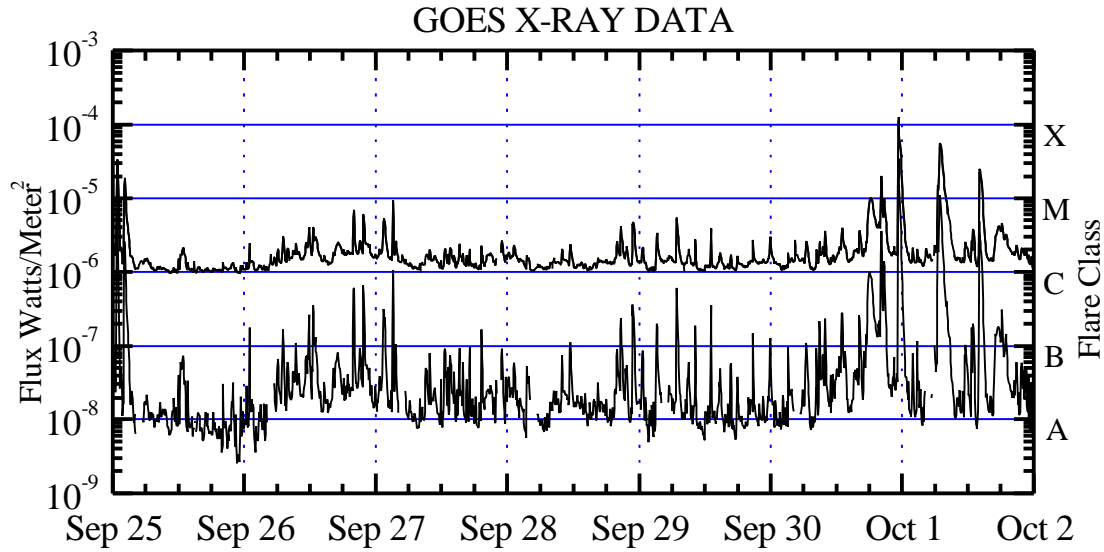
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-8.

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*K<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the USAF 55<sup>th</sup> Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K<sub>p</sub> values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K<sub>p</sub> are "global" parameters that are applicable to a first order approximation over large areas. H<sub>p</sub> is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



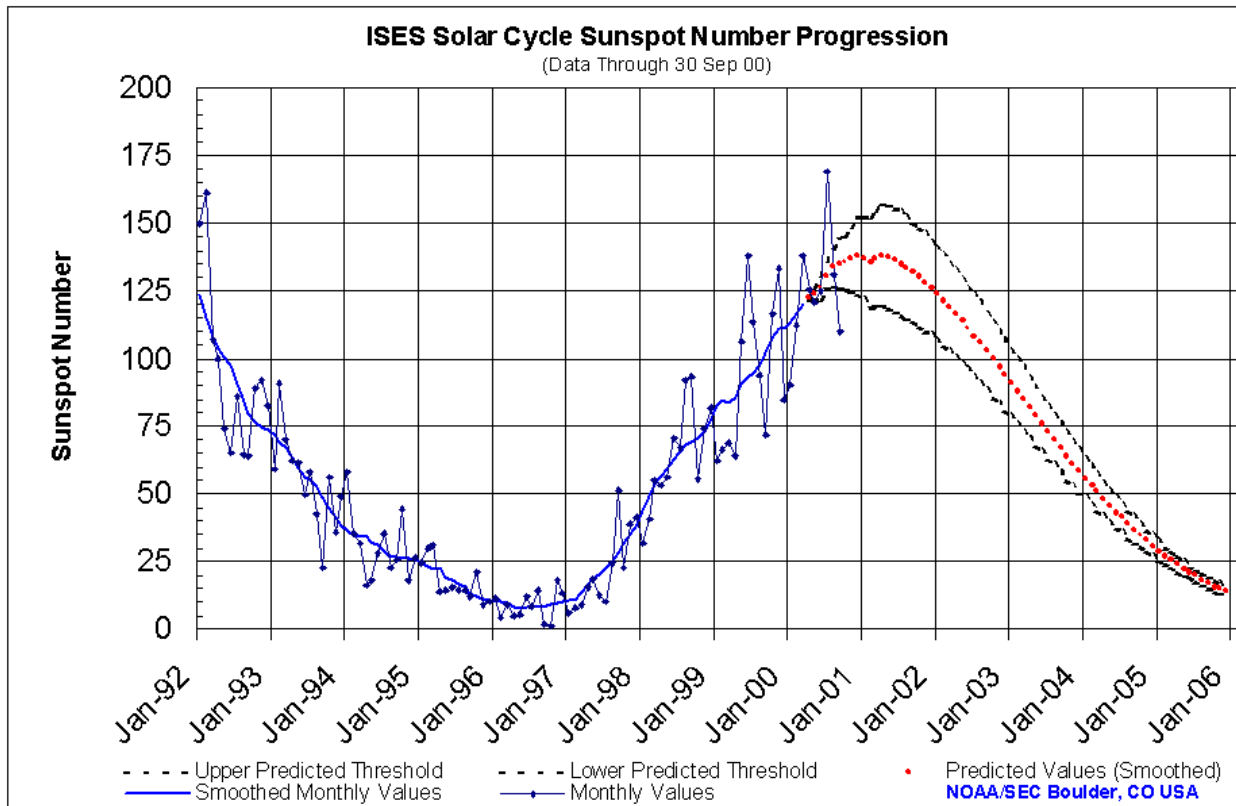


#### *Weekly GOES Satellite X-ray and Proton Plots*

X-ray plot contains five minute averaged x-ray flux ( $\text{watts/m}^2$ ) as measured by GOES 8 and 10 in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five minute averaged integral proton flux ( $\text{protons/cm}^2\text{-sec-sr}$ ) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ( $\text{protons/cm}^2\text{-sec-sr}$ ) at greater than 10 MeV.



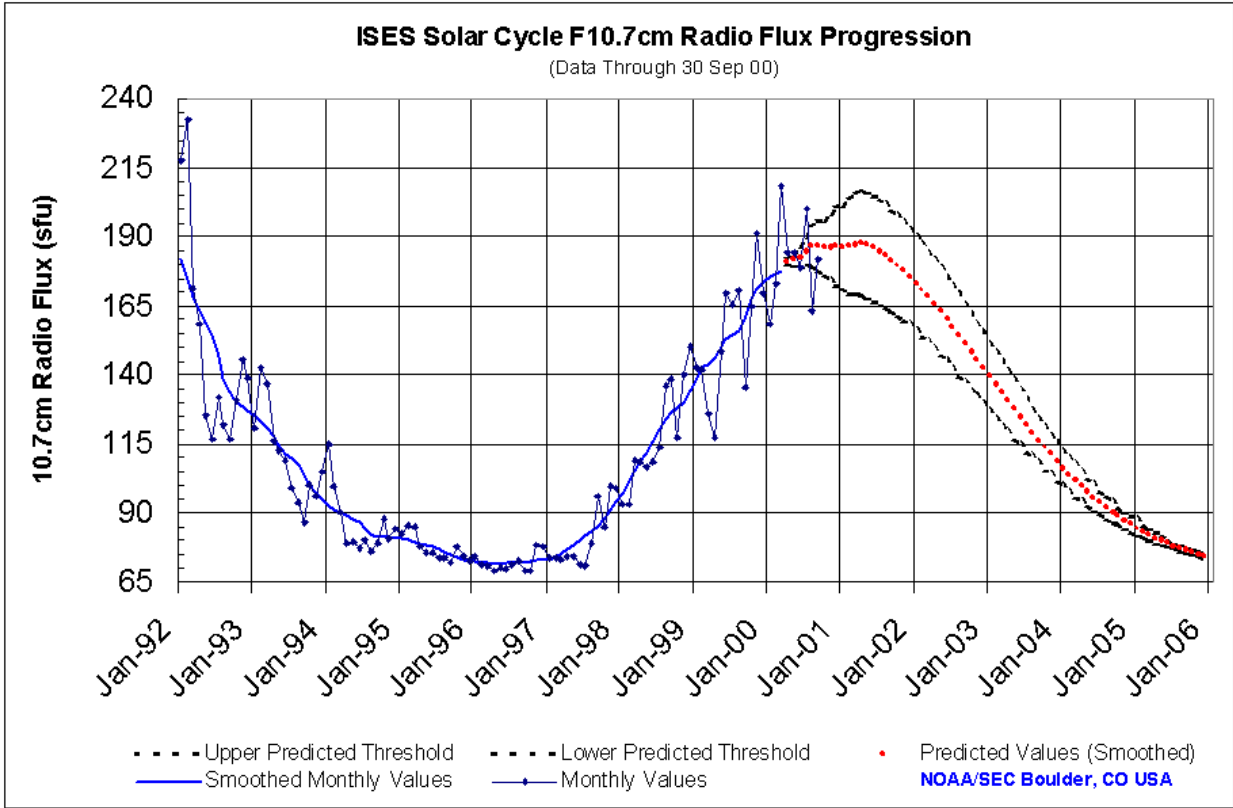


### SEC Prediction of Smoothed Sunspot Number

|      | Jan        | Feb        | Mar        | Apr        | May        | Jun        | Jul        | Aug        | Sep        | Oct        | Nov        | Dec        |
|------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1996 | 10         | 10         | 10         | 9          | 8          | 9          | 8          | 8          | 8          | 9          | 10         | 10         |
|      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      |
| 1997 | 11         | 11         | 14         | 17         | 18         | 20         | 23         | 25         | 28         | 32         | 35         | 39         |
|      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      |
| 1998 | 44         | 49         | 53         | 57         | 59         | 63         | 66         | 68         | 70         | 71         | 73         | 78         |
|      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      |
| 1999 | 83         | 85         | 84         | 86         | 91         | 93         | 94         | 97         | 102        | 108        | 111        | 111        |
|      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      | (***)      |
| 2000 | 113        | 117        | 120        | <b>122</b> | <b>124</b> | <b>126</b> | <b>130</b> | <b>134</b> | <b>135</b> | <b>135</b> | <b>137</b> | <b>138</b> |
|      | (***)      | (***)      | (***)      | (1)        | (2)        | (4)        | (5)        | (7)        | (9)        | (10)       | (12)       | (14)       |
| 2001 | <b>137</b> | <b>136</b> | <b>137</b> | <b>138</b> | <b>137</b> | <b>136</b> | <b>135</b> | <b>133</b> | <b>132</b> | <b>130</b> | <b>128</b> | <b>126</b> |
|      | (15)       | (17)       | (18)       | (19)       | (19)       | (19)       | (19)       | (19)       | (18)       | (18)       | (18)       | (17)       |
| 2002 | <b>124</b> | <b>121</b> | <b>119</b> | <b>116</b> | <b>114</b> | <b>111</b> | <b>108</b> | <b>106</b> | <b>103</b> | <b>100</b> | <b>97</b>  | <b>94</b>  |
|      | (17)       | (17)       | (16)       | (16)       | (16)       | (15)       | (15)       | (15)       | (14)       | (14)       | (13)       | (13)       |
| 2003 | <b>91</b>  | <b>88</b>  | <b>85</b>  | <b>82</b>  | <b>79</b>  | <b>76</b>  | <b>73</b>  | <b>70</b>  | <b>67</b>  | <b>64</b>  | <b>61</b>  | <b>58</b>  |
|      | (12)       | (12)       | (12)       | (11)       | (11)       | (10)       | (10)       | (9)        | (9)        | (9)        | (8)        | (8)        |
| 2004 | <b>56</b>  | <b>53</b>  | <b>51</b>  | <b>48</b>  | <b>46</b>  | <b>43</b>  | <b>41</b>  | <b>39</b>  | <b>37</b>  | <b>35</b>  | <b>33</b>  | <b>31</b>  |
|      | (7)        | (7)        | (7)        | (6)        | (6)        | (6)        | (5)        | (5)        | (5)        | (4)        | (4)        | (4)        |
| 2005 | <b>29</b>  | <b>27</b>  | <b>25</b>  | <b>24</b>  | <b>22</b>  | <b>21</b>  | <b>20</b>  | <b>18</b>  | <b>17</b>  | <b>16</b>  | <b>15</b>  | <b>14</b>  |
|      | (4)        | (3)        | (3)        | (3)        | (3)        | (2)        | (2)        | (2)        | (2)        | (2)        | (2)        | (1)        |







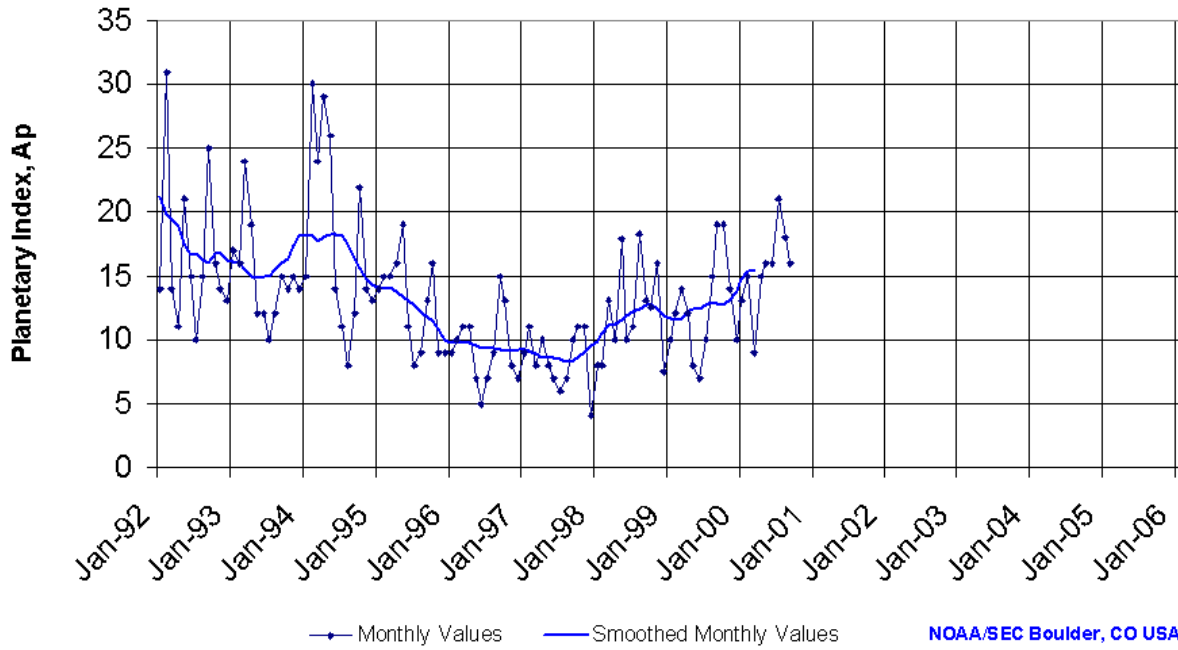
### SEC Prediction of Smoothed F10.7cm Radio Flux

|      | Jan                | Feb                | Mar                | Apr                | May                | Jun                | Jul                | Aug                | Sep                | Oct                | Nov                | Dec                |
|------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 1996 | 72<br>(***)        | 72<br>(***)        | 72<br>(***)        | 72<br>(***)        | 71<br>(***)        | 72<br>(***)        | 72<br>(***)        | 72<br>(***)        | 72<br>(***)        | 73<br>(***)        | 73<br>(***)        | 73<br>(***)        |
| 1997 | 73<br>(***)        | 74<br>(***)        | 75<br>(***)        | 77<br>(***)        | 78<br>(***)        | 80<br>(***)        | 82<br>(***)        | 83<br>(***)        | 86<br>(***)        | 89<br>(***)        | 91<br>(***)        | 94<br>(***)        |
| 1998 | 98<br>(***)        | 102<br>(***)       | 106<br>(***)       | 109<br>(***)       | 112<br>(***)       | 116<br>(***)       | 120<br>(***)       | 124<br>(***)       | 127<br>(***)       | 128<br>(***)       | 130<br>(***)       | 134<br>(***)       |
| 1999 | 139<br>(***)       | 143<br>(***)       | 144<br>(***)       | 146<br>(***)       | 150<br>(***)       | 153<br>(***)       | 154<br>(***)       | 156<br>(***)       | 161<br>(***)       | 167<br>(***)       | 172<br>(***)       | 173<br>(***)       |
| 2000 | 175<br>(***)       | 176<br>(***)       | 178<br>(***)       | <b>181</b><br>(1)  | <b>182</b><br>(2)  | <b>183</b><br>(4)  | <b>185</b><br>(5)  | <b>187</b><br>(7)  | <b>187</b><br>(9)  | <b>186</b><br>(10) | <b>186</b><br>(12) | <b>187</b><br>(14) |
| 2001 | <b>186</b><br>(15) | <b>186</b><br>(17) | <b>187</b><br>(18) | <b>188</b><br>(19) | <b>187</b><br>(19) | <b>186</b><br>(19) | <b>185</b><br>(19) | <b>183</b><br>(19) | <b>181</b><br>(18) | <b>180</b><br>(18) | <b>178</b><br>(18) | <b>175</b><br>(17) |
| 2002 | <b>173</b><br>(17) | <b>171</b><br>(17) | <b>168</b><br>(16) | <b>166</b><br>(16) | <b>163</b><br>(16) | <b>160</b><br>(15) | <b>157</b><br>(15) | <b>155</b><br>(15) | <b>152</b><br>(14) | <b>149</b><br>(14) | <b>146</b><br>(13) | <b>143</b><br>(13) |
| 2003 | <b>139</b><br>(12) | <b>136</b><br>(12) | <b>133</b><br>(12) | <b>131</b><br>(11) | <b>128</b><br>(11) | <b>125</b><br>(10) | <b>122</b><br>(10) | <b>119</b><br>(8)  | <b>116</b><br>(8)  | <b>114</b><br>(8)  | <b>111</b><br>(7)  | <b>109</b><br>(7)  |
| 2004 | <b>106</b><br>(6)  | <b>104</b><br>(6)  | <b>102</b><br>(6)  | <b>100</b><br>(5)  | <b>98</b><br>(5)   | <b>96</b><br>(5)   | <b>94</b><br>(4)   | <b>92</b><br>(4)   | <b>90</b><br>(4)   | <b>89</b><br>(3)   | <b>87</b><br>(3)   | <b>86</b><br>(3)   |
| 2005 | <b>85</b><br>(3)   | <b>83</b><br>(2)   | <b>82</b><br>(2)   | <b>81</b><br>(2)   | <b>80</b><br>(2)   | <b>79</b><br>(1)   | <b>78</b><br>(1)   | <b>77</b><br>(1)   | <b>77</b><br>(1)   | <b>76</b><br>(1)   | <b>75</b><br>(1)   | <b>75</b><br>(1)   |



### ISES Solar Cycle Ap Progression

(Data Through 30 Sep 00)



# Optical Flares



Space Environment Center



September 2000  
(Month 48)

Preliminary data

Comparison of Cycles at current month in cycle

